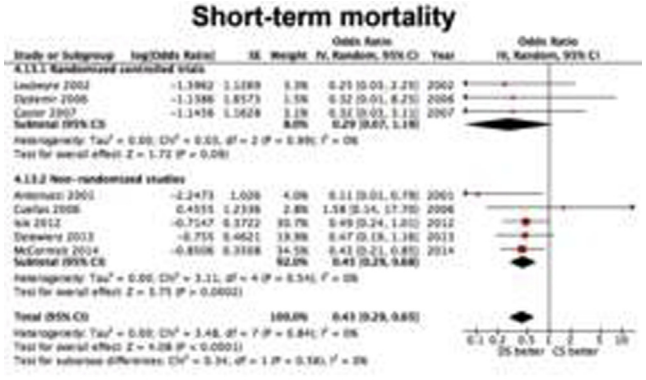

Conclusions: The available evidence suggests that DS in STEMI is associated with better clinical and procedural outcomes, in particular lower mortality, as compared with CS.

TCT-18

Predictors of LVEF Improvement after Primary Stenting in ST-Segment Elevation Myocardial Infarction: The HORIZONS-AMI trial

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Background: Decreased LVEF at presentation during STEMI has been established as a predictor of morbidity and mortality. Many patients have improvement in LVEF over time due to recovery of hibernating or stunned myocardium. Little data exists on the clinical and angiographic predictors of improvement in LVEF after stenting.
Methods: In HORIZONS-AMI, 3,602 patients presenting with STEMI at 123 sites were randomized to heparin + a glycoprotein IIb/IIIa inhibitor (H+GPI) vs. bivalirudin, and to paclitaxel-eluting stents vs. bare metal stents. Clinical follow-up was performed for three years, including routine angiographic follow-up at 13 months in a pre-specified substudy.
Results: Baseline and 13-month follow-up LVEF measurements were available in 656 patients, comprising the current study cohort. The median change [interquartile range] in LVEF from baseline to 13 months was +2.4% [-5.85%, 11.80%]. During follow-up LVEF rose or remained the same in 379 (57.8%) patients (median Δ +9.8% [4.30%, 16.40%]), and fell in 277 (42.2%) patients (median Δ -7.0% [-11.80%, -3.60%]). By multivariable analysis, independent predictors of improvement in LVEF were female sex (p=0.002) and TIMI 3 flow after PCI (p=0.03), while longer lesion length (p=0.04), greater peak CKMB (p< 0.0001) and higher baseline LVEF (p< 0.0001) predicted LVEF decrease (Table). Of note, use of drug-eluting vs. bare metal stents, bivalirudin vs. H+GPI, symptom-to-balloon time, and discharge use of beta-blockers or ACEI/ARBs were not significant predictors of LVEF improvement.

Table. Multivariable Correlates of LVEF Improvement from Baseline to 13 Months

Multivariable Correlates	Odds Ratio [95% CI] (adjusted)	P Value
Female sex	2.08 [1.3, 3.33]	0.002
Baseline LVEF	0.90 [0.88, 0.91]	<0.0001
Peak CKMB	1.00 [1.00, 1.00]	<0.0001
TIMI 3 flow post-PCI	1.96 [1.06, 3.62]	0.03
Total lesion length	0.98 [0.97, 1.00]	0.04

Conclusions: While LVEF improves during follow-up in more than half of patients after primary PCI, a significant proportion have worsening LV function over time. Further approaches are required to improve myocardial recovery after mechanical reperfusion therapy in STEMI.

TCT-19

Predictors of Target Vessel Revascularization after Primary Percutaneous Coronary Intervention for Acute ST-Segment Elevation Myocardial Infarction: Lessons from HORIZONS-AMI

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Background: Primary percutaneous coronary intervention (PCI) is the preferred method of reperfusion in ST-segment elevation myocardial infarction (STEMI). Target vessel revascularization (TVR) due to restenosis or disease progression may compromise the benefits of primary PCI. The predictors and impact of TVR after STEMI are not well understood.
Methods: In HORIZONS AMI 3,602 patients with STEMI were randomized to bivalirudin vs. heparin and a glycoprotein IIb/IIIa inhibitor; stents were implanted in 3,202 patients. Ischemia-driven TVR of the infarct-related artery (IRA) required recurrent angina and/or signs of ischemia and ≥50% diameter restenosis, or ≥70% diameter stenosis even in the absence of ischemia.
Results: TVR occurred in 219 (6.9%) patients at 1 year, 392 (12.9%) at 2 years, and 437 (14.4%) at 3 years. Repeat PCI was performed in 410 (93.0%) patients and CABG in 48 (11.4%, not mutually exclusive). TVR was ischemia-driven in 418 patients (95.7%). TVR was due to restenosis in 343 patients (80.2%) and disease progression in 94 (19.8%). Patients with vs. without TVR had similar rates of death (6.6% vs. 6.3%, P=0.87), but markedly higher rates of MI (35.3% vs. 2.7%, P< 0.0001) and non-CABG major bleeding (13.8% vs. 7.8%, P< 0.001). Of the 151 MI events in the TVR group, 29 (19.2%) occurred before (average 35 days) TVR, 13 (8.6%) occurred after (average 166 days) TVR, and the rest (72.2%) occurred on same day as TVR. Half of the MIs before TVR occurred within 48 hours of it, suggesting that TVR was the result of the MI. Target lesion definite ST occurred in 29.2% of TVR patients and in 0.4% of non-TVR group, P< 0.0001. Only one third of them occurred beyond 1 year. Independent predictors of TVR were more extensive CAD (HR=1.18 per diseased vessel, P=0.006), smaller vessel size (HR=1.37 per mm, P=0.006), longer lesion length (HR=1.01 per mm, P=0.003), scheduled angiographic follow-up (HR=1.41, P=0.001) and treatment with bare metal rather than drug-eluting stents (HR=1.59, P< 0.0001).
Conclusions: TVR occurs in 1 of every 7 STEMI patients within 3 years after primary PCI, is usually due to restenosis rather than disease progression, and is strongly related to adverse outcomes (but not death).

TCT-20

Pressure-controlled Intermittent Coronary Sinus Occlusion (PICSO) in Acute ST-segment Elevation Myocardial Infarction: Final Results of the Prepare RAMSES Study

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Background: Myocardial perfusion is impaired in up to 40% of patients after primary PCI (pPCI) for ST-segment elevation myocardial infarction (STEMI), which is associated with adverse clinical outcomes. Pressure-controlled intermittent coronary sinus occlusion (PICSO) aims to improve microvascular perfusion after pPCI by intermittently increasing the pressure in the cardiac venous outflow tract by means of a balloon-tipped catheter in the coronary sinus. We evaluated the safety and feasibility of adjuvant PICSO after pPCI for STEMI, and its effects on infarct size and myocardial function.
Methods: We enrolled 30 patients after successful pPCI for anterior STEMI. PICSO for 90 minutes was attempted, and the quantity of PICSO therapy provided throughout the procedure was documented (mm Hg of coronary sinus pressure modulation). Infarct size and myocardial function were assessed by cardiovascular magnetic resonance (CMR) at 2-5 days and 4-months post-pPCI, and the results were compared with a matched historical control group.
Results: PICSO could be initiated in 19 patients (63%). Major adverse safety events occurred in 1 patient (3%). When PICSO could be initiated, median PICSO duration was 88.8 min (Q1–Q3: 72.0–89.6 min), and could be maintained for 90(±2) minutes in 12 patients (40%). However, the quantity of PICSO therapy varied from 15 to 2735 mmHg